

Applicant : Ming Lai
Serial No. : 10/718,451
Filed : 11/19/2003
Page : 2

CLAIM AMENDMENT

Please amend the claims as follows:

1. (Currently amended): An ophthalmic adaptive-optics instrument for obtaining patient-verified prescription of low and high-order aberrations, comprising:

an observation target disposed for a subject eye to fixate upon;

an aberration-compensating element disposed in the observation path of said subject eye, wherein said aberration-compensating element is driven by a control signal and is capable of compensating low and high-order aberrations of said subject eye;

a wavefront-sensing device sensing the aberration of said subject eye via said aberration-compensating element, wherein said wavefront-sensing device measures a residual aberration of said subject eye through said aberration-compensating element with controllable aberration compensation;

processing electronics coupled to said wavefront-sensing device and accepting a command signal to generate said control signal to drive said aberration-compensating element; and

subjective feedback control means enabling the patient to actively produce said command signal to adjust said aberration-compensating element and to verify the amount of aberration compensation for optimal visual acuity;

wherein said ophthalmic adaptive-optics instrument can measure the total aberration of said subject eye, corresponding to a null command signal, and the residual

aberration for optimal visual acuity, corresponding to a command signal for optimal visual acuity; and wherein said ophthalmic adaptive-optics instrument provides, by subtracting said residual aberration for optimal visual acuity from said total aberration, said patient-verified prescription of low and high-order aberrations.

2. (Original): An ophthalmic adaptive-optics instrument of claim 1, wherein said aberration-compensating element is a deformable mirror.

3. (Original): An ophthalmic adaptive-optics instrument of claim 1, wherein said aberration-compensating element consists of a deformable mirror and a set of compensation lenses.

4. (Original): An ophthalmic adaptive-optics instrument of claim 1, wherein said aberration-compensating element is a spatial phase modulator.

5. (Original): An ophthalmic adaptive-optics instrument of claim 1, wherein said wavefront-sensing device is a Hartmann-Shack wavefront sensor.

6. (Original): An ophthalmic adaptive-optics instrument of claim 1, wherein said wavefront-sensing device is a curvature wavefront sensor.

7. (Currently amended): A method for obtaining patient-verified prescriptions of low and high-order aberrations, comprising the steps of:

Applicant : Ming Lai
Serial No. : 10/718,451
Filed : 11/19/2003
Page : 4

providing an observation target for a subject eye to
fixate;

providing an aberration-compensating element disposed in
the observation path of said subject eye, wherein said
aberration-compensating element is driven by a control
signal and is capable to compensate low and high order
aberrations of said subject eye;

providing a wavefront-sensing device to sense the
aberration of said subject eye via said aberration-
compensating element, wherein said wavefront-sensing
device measures a residual aberration of said subject
eye through said aberration-compensating element with
controllable aberration compensation;

providing processing electronics coupled to said
wavefront-sensing device and read in a command signal;
generating said control signal to drive said aberration-
compensating element;

providing subjective feedback control means to enable the
patient actively to produce said command signal to
adjust said aberration-compensating element and to
verify the amount of aberration compensation for optimal
visual acuity;

measuring the total aberration of said subject eye,
corresponding to a null command signal;

measuring the residual aberration for optimal visual
acuity, corresponding to a command signal for optimal
visual acuity; and

determining said patient-verified prescription of low and
high-order aberration by subtracting said residual
aberration for optimal visual acuity from said total
aberration.

Applicant : Ming Lai
Serial No. : 10/718,451
Filed : 11/19/2003
Page : 5

- 8. (Withdrawn)
- 9. (Cancelled)
- 10. (Cancelled)
- 11. (Cancelled)
- 12. (Cancelled)
- 13. (Cancelled)
- 14. (Withdrawn)
- 15. (Withdrawn)
- 16. (Withdrawn)
- 17. (Withdrawn)
- 18. (Withdrawn)
- 19. (Withdrawn)
- 20. (Withdrawn)
- 21. (Withdrawn)
- 22. (Withdrawn)

23. (Previously added) An ophthalmic adaptive-optics instrument of claim 1, further comprising:

relay optics relaying wavefront at pupil of said subject eye to said aberration-compensating element.

24. (Previously added) An ophthalmic adaptive-optics instrument of claim 23, wherein said relay optics comprises two or more lenses.

25. (Previously added) An ophthalmic adaptive-optics instrument of claim 23, wherein said relay optics includes a set of compensation lenses to compensate low order aberrations of said subject eye.

Applicant : Ming Lai
Serial No. : 10/718,451
Filed : 11/19/2003
Page : 6

26. (New) An ophthalmic adaptive-optics instrument of claim 1, wherein said observation target has an illuminated starburst pattern.

27. (New) An ophthalmic adaptive-optics instrument of claim 1, wherein said subjective feedback control is operated by said patient himself or herself.

28. (New) An ophthalmic adaptive-optics instrument of claim 1, wherein said subjective feedback control is operated by a second party other than said patient.

29. (New) An ophthalmic adaptive-optics instrument of claim 1, wherein data of said patient-verified prescription is saved in electronic format.

30. (New) An ophthalmic adaptive-optics instrument of claim 1, wherein data of said patient-verified prescription is transformable through electronic means.